

Claims

- [c1] 1. A driving circuit of a current-driven active matrix organic light emitting diode (AMOLED), comprising:
an AMOLED pixel connected to a current source, the current source being used to charge/discharge a capacitor connected to a gate of a driving thin film transistor, and a gray scale of the AMOLED pixel is determined by a magnitude of a current provided by the current source;
and
a pre-charge switch connected to the gate of the driving thin film transistor and a driving power source, for controlling the driving power source to pre-charge the capacitor before the current source charges/discharges the capacitor.
- [c2] 2. The driving circuit of claim 1, wherein the driving thin film transistor is an N-type thin film transistor, and the AMOLED pixel further comprises:
an organic light emitting diode (OLED) having an anode and a cathode, the anode being connected to a positive power source;
a first switch with one end connected to the cathode of the OLED and another end connected to a drain of the

driving thin film transistor;
a second switch with one end connected to the current source and another end connected to the drain of the driving thin film transistor; and
a third switch with one end connected to the drain of the driving thin film transistor and another end connected to the gate of the driving thin film transistor and one end of the capacitor, and the other end of the capacitor being connected to a negative power source.

[c3] 3. The driving circuit of claim 2, wherein the first, the second, the third switches and the pre-charge switch are N-type thin film transistors.

[c4] 4. The driving circuit of claim 2, wherein the first, the second, the third switches and the pre-charge switch are P-type thin film transistors.

[c5] 5. The driving circuit of claim 2, wherein the positive power source is used as the driving power source.

[c6] 6. The driving circuit of claim 1, wherein the driving thin film transistor is a P-type thin film transistor, and the AMOLED pixel further comprises:
an organic light emitting diode (OLED) having an anode and a cathode, the anode being connected to a negative power source;

a first switch with one end connected to the anode of the OLED and another end connected to a drain of the driving thin film transistor;

a second switch with one end connected to the current source and another end connected to the drain of the driving thin film transistor; and

a third switch with one end connected to the drain of the driving thin film transistor and another end connected to the gate of the driving thin film transistor and one end of the capacitor, and the other end of the capacitor being connected to a positive power source.

[c7] 7. The driving circuit of claim 6, wherein the first, the second, the third switches and the pre-charge switch are P-type thin film transistors.

[c8] 8. The driving circuit of claim 6, wherein the first, the second, the third switches and the pre-charge switch are N-type thin film transistors.

[c9] 9. The driving circuit of claim 6, wherein the negative power source is used as the driving power source.

[c10] 10. The driving circuit of claim 1, wherein a pre-charged voltage level across the capacitor is close to a threshold voltage of the thin film transistor.

[c11] 11. The driving circuit of claim 1, wherein the driving

power source comprises two different voltage levels.

- [c12] 12. A method for driving a current-driven active matrix organic light emitting diode (AMOLED) pixel, wherein an AMOLED pixel is connected to a current source and a driving power source for charging/discharging a capacitor connected to a gate of a driving thin film transistor of the AMOLED pixel, the method comprising the steps of: pre-charging the capacitor by using the driving power source; adjusting a gray-scale charging voltage of the capacitor by using the current source; and stopping charging/discharging the capacitor through the current source to control the AMOLED pixel to enter an illumination stage.
- [c13] 13. The method of claim 12, wherein the capacitor is pre-charged to a voltage that is close to a threshold voltage of the thin film transistor.
- [c14] 14. The method of claim 12, wherein the driving power source comprises two different voltage levels.